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May 26, 2004

Congressional Research Service
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RL31093

CRS REPORT
Prepared for Members and
Committees of Congress

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SUMMARY

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May 26, 2004

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The Foreign Operations Act (P.L. 102-391) signed on October 6, 1992 allows the U.S. quota, or contribution, increase to the IMF of $12 billion to be used to "...support monetary stability in member countries through the instrumentality of currency boards." What is a currency board? How does it differ from an alternative monetary arrangement such as a central bank? Why was it adopted by countries with histories of chronic inflation (e.g., Argentina) and those emerging from the Soviet bloc (e.g., Bulgaria), and urged upon those suddenly hit by currency speculation (e.g., Indonesia)? What role did the currency board play in Argentina's 2001-2003 financial difficulties and why was it abandoned? Although factors affecting the decision to adopt a currency board vary from country to country, as do outcomes, fundamental differences between currency boards and central banks remain constant. This report focuses on their differences to provide a foundation for evaluating disparate cases.

To understand the differences, it should be noted that the most important function of a central bank is its ability to alter the supply of money. When this power is abused, as occurs when central banks must provide the monetary wherewithal to finance government budget deficits, it undermines the functions that money performs in a market economy: that of a unit of account, medium of exchange, and store of value. History is replete with episodes of such an abuse of monetary policy. The most egregious consequences of abuse are to be found in episodes of hyperinflation with prices rising daily. Countries have sought a variety of monetary arrangements to curtail abuse in the issuance of money.

A significant example is a currency board. Currency boards now function in Bulgaria, Hong Kong, Djibouti, Lithuania, Estonia, and Brunei, and are promoted by some economists as a means for developing countries to achieve macroeconomic stability. The sole function of these boards is to issue currency (and coins) that are 100% backed by a commodity (e.g., gold and silver) or by the stable valued currency of another country. A currency board is forbidden from altering the amount of currency by buying or selling assets denominated in domestic money. As a result, the currency it issues is "safe" or of stable value (or as stable in value as the currency to which it is linked), and this stability would contribute to the vital role money plays in market economies. A currency board arrangement is very similar in nature to the formal adoption of another country's currency, popularly known as "dollarization."

Using a currency board has a potential downside for a country. It is exposed to every shock that affects the exchange rate of the country to which it has tied its currency, and prevents the use of monetary policy to counter those shocks. Argentina is a recent example of what can happen in a currency board country. Argentina linked its currency to the U.S. dollar. The large appreciation of the dollar between mid-1995 and 2002 had a severely depressing affect on the Argentine economy which led to the abandonment of the currency board and economic crisis. Unlike central banks, currency boards also lack a lender-of-last-resort function. In a financial crisis, currency boards would be unable to lower interest rates and lend banks money to quell bank runs. This report will not be updated.

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A major institution in most modern market economies is a central bank. The Federal Reserve System of the United States is an example. It has a variety of powers and functions to perform. Important among these is the ability to alter the reserve and lending base of commercial banks (and in the process, the supply of money), to act as the lender of last resort to the financial system, to provide facilities for clearing checks, to serve as fiscal adviser to the federal government, and to provide economic advice.

Suppose that the Federal Reserve were suddenly shorn of all its powers and, instead, its sole function was to issue currency and coins that were secured or backed 100% by gold, silver or other commodities or by the currency of another country, such as Switzerland or Germany whose inflation rate had been low for a considerable period of time. Further, suppose that the exchange rate of the dollar in terms of the commodity or foreign currency would be fixed immutably and could only be changed under circumstances that were well defined in the law. Moreover, to ensure that the new system worked as intended, a majority of the governors of the "reformed" Federal Reserve would be foreigners, the institutional headquarters and the site where the reserves of the system were deposited would be in some foreign "safe haven," and these reserves would be inaccessible to the government of the United States.

Many informed Americans would, no doubt, consider this a radical change in the conduct of U.S. monetary policy. Yet, this type of monetary regime, which is called a "currency board," is currently in use in the manner described in this paper in Bulgaria, Hong Kong, Djibouti, Lithuania, Estonia and Brunei.[1] It played an important role in Argentina between 1991 and 2002.

An important role of Congress is to work with the Administration, the Federal Reserve, and international institutions such as the International Monetary Fund to build a stable and prosperous world economy. A prosperous world economy is beneficial to the American economy, through a robust international trade sector, and it is thought to bring political benefits as well, through its perceived salutary effect on the political stability of our allies. Sustainable exchange rate regimes are a key element of a stable macroeconomic framework, and a stable macroeconomic framework is a prerequisite to a country's development prospects. These conditions have been recognized by Congress. To that end, Congress recommended in P.L.102-391, signed October 6, 1992 to take effect in FY1993, that the IMF quota increase be used to "...support monetary stability in member countries through the instrumentality of currency boards."

Proponents claim that a currency board can offer a stable exchange rate and monetary regime to a developing country with a history of macroeconomic instability. It was introduced in Argentina as an intended cure for that country's problems with high inflation and in Bulgaria, Estonia, and Lithuania to aid them in their transition to a market economy. During the Asian crisis, proponents urged its adoption in Indonesia to help stabilize its depreciating currency. Opponents claim that a currency board has the potential to further destabilize countries already hampered by past mistakes. Opponents claim that the presence of a currency board was central to Argentina's 1999-2002 problems.[2] This report will describe a currency board monetary regime, how it functions,

[1] Currency boards were widely used in British colonies. When these colonies became independent, many decided to replace their currency boards with central banks. For a discussion of this experience, see H.A. Shannon, "Evolution of the Colonial Sterling Exchange Standard," *International Monetary Fund Staff Papers*, April 1961, pp. 334-354; H.A. Shannon, "The Modern Colonial Sterling Exchange Standard," *International Monetary Fund Staff Papers*, April 1952, pp. 318-363; Joachim W. Kratz, "The East African Currency Board," *International Monetary Fund Staff Papers*, July 1966, pp. 229-253; and, "Analyst," "Currency and Banking in Jamaica," *Social and Economic Studies*, Aug. 1953, pp. 41-53.

[2] For more information, see U.S. Library of Congress, Congressional Research Service, *Argentina: Economic Problems and Solutions*, by Gail E. Makinen, CRS Report RL31169 and *The Financial Crisis in Argentina* by J.F. Hornbeck,

how it compares with a central bank system, and discuss assessments of its strengths and limitations.

The Currency Board System

In this type of monetary regime, an institution is created known as a currency board[3] whose only function is to issue and exchange local currency and coin on demand at a fixed rate of exchange for a given quantity of a commodity or for a foreign currency (known, respectively, as the reserve asset and reserve currency, and the country whose assets back the currency board is known as the reserve country). In Argentina, for example, the currency board could only issue the local currency, called the peso, upon the receipt of U.S. dollars. Likewise, it would exchange dollars for pesos on a one-for-one basis. As a result, the notes and coins issued by currency boards are secured 100% by a commodity or a foreign currency (in the case of Argentina, by the U.S. dollar).

In actual practice, a currency board would not hold all its assets in the foreign currency. Rather, some of its assets, perhaps a large proportion, would be held in an interest-earning form denominated in the reserve currency (e.g., U.S. Treasury bond). This helps ensure that the board earns sufficient income to offset the expenses of maintaining its currency and coins in circulation as well as build up a reserve to cover any possible losses that might be sustained because of adverse movements in the interest rates on the securities it holds, or due to defaults.

It is important to note that a currency board would be prohibited from purchasing any assets, financial or otherwise, denominated in local currency. If it were not so prohibited, it could function exactly as a central bank and be able to independently alter the money supply and short-term interest rates through so-called "open market operations."[4] Thus, the use of a major policy tool in traditional monetary policy involving variations in the supply of money through open market operations is ruled out. The inability to engage in a discretionary monetary policy is likely to be a major reason why currency boards remain an unattractive alternative for many countries.

Nothing in a currency board regime would prohibit commercial banks in that country from existing and issuing demand, saving, and time deposits as well as money market accounts. Thus, the existence of a currency board does not rule out the development of a range of liquid financial assets or the development of commercial banking or the financial system in general. The deposits of commercial banks, however, would not be backed 100% by reserve currency. The type of fractional reserve banking typical of the United States and other developed countries could be a feature of a currency board regime.[5] Hypothetically, unless explicitly prohibited, variations in the

CRS Report RS21072.

[3] The following discussion draws heavily on the work of: Alan Walters, "Currency Boards," in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: A Dictionary of Economics*. Macmillan, (London: 1987), pp. 740-742; Steve H. Hanke and Kurt Schuler, *Currency Boards for Eastern Europe*, The Heritage Lectures, (Washington: 1991); Hanke and Schuler, *Currency Convertibility: A Self-Help Blueprint for the Commonwealth of Independent States*, Foreign Policy Briefing, Cato Institute, (Washington: Jan. 22,1992); Hanke and Schuler, *Currency Boards: A Summary*, May 17, 1992; Anna J. Schwartz, *Currency Boards: Their Past, Present, and Possibly Future Role,* Carnegie-Rochester Conference on Public Policy, Nov. 20-21, 1992; and John Williamson, *What Role for Currency Boards?* Institute for International Economies, (Washington: Sept. 1995).

[4] Open market operations involve the purchase of government securities or other qualified assets such as commercial paper or foreign exchange by the central bank. When these assets are purchased, the effect on the economy is the same as if new currency were created. Economists say that these open market operations create "high powered money" since this money can serve as the reserves of the banking system and be used to create multiple dollars of deposit money.

[5] Banks in the United States are legally obligated to hold a sum equal to 10% of their demand deposits above $42.8

reserve ratio by some central authority would make possible some variations in the *money supply* relative to the base of reserve currency or amount of local currency outstanding.

The assorted non-monetary functions often performed by central banks would have to be assumed by some other government agency. These include serving as a depository for bank reserves, acting as a lender of last resort to the banking system, managing foreign exchange reserves, operating a clearing house, serving as a fiscal agent for the government, administering a deposit insurance system, regulating financial institutions, and offering economic advice to the government.

Countries that have currency boards are not precluded from participating in international trade and are likely to be both international lenders and the recipient of international capital flows. Their participation in the world of international trade and finance is, however, somewhat indirect. The exchange rate between their currency and the currency of the reserve country is *fixed*. Even though the two currencies may look different, reflecting preferences in national design, they are exchangeable at a fixed rate. Since they are fixed, the currency board country's exchange rate with the rest of the world is automatically determined by the reserve country's exchange rate with the rest of the world. Thus, if Estonia, a currency board country, links its currency to the euro, and the euro appreciates in foreign exchange markets by, say, 25%, the Estonian currency would also appreciate by the same amount. This means that any change in the exchange rate of the reserve country relative to that of any other country will also be experienced by the currency board country. As explained below, this can be a disadvantage of a currency board. If the currency of the reserve country appreciates on world financial markets, it could force a deflation on the currency board country.

Money Supply Growth

While excessive money supply growth is the source of excessive inflation, some money growth is necessary for a stable price level. Price level stability requires that the growth in money spending match the growth in potential output. And the growth in money spending is likely to require some growth in the supply of money. In a currency board regime, money supply growth can come about from either the growth in currency or the growth in those bank deposits counted as money (e.g., deposits on which checks can be drawn).

For *currency* to grow, the currency board must acquire additional reserve currency or reserve assets and this happens primarily through the balance of international payments. The currency board country must receive in payment more than is paid out for the trade of goods and services; receipts from gifts, unilateral transfers, and other income; and from the sale of capital assets (i.e., an inflow of foreign investment).[6] This net difference is then settled by an inflow of monies that can be converted into reserve currency. The growth in reserve currency will then permit an increase in the local currency issued by the currency board.

The money supply itself can continue to increase even if the stock of currency remains constant. This can and does occur when individuals desire to hold less of their liquid wealth in the form of currency. The redundant currency is then deposited in banks where it serves as reserves for a

million (3% below $42.8 million) in the form of currency, in their own vaults, or on deposit with the Federal Reserve. Against all other deposits, banks hold reserves which prudence suggests are adequate to meet sudden withdrawals. In the currency board system, these reserves would take the form of local currency and would be held either as vault cash or on deposit with a government agency other than the currency board. The latter would not be a depository for bank reserves.

[6] There is one other way for the supply of currency to grow. This is from the income earned on the reserve assets held by the currency board. These earnings, however, will be recorded in the country's international balance of payments.

multiple increase in the amount of deposit money. In addition, as noted above, some central authority could alter the legal reserve requirement imposed on bank deposits, allowing some additional flexibility in the supply of money. There are, of course, limits to the range of variation in reserve requirements.

The question arises whether a currency board regime can provide for a rate of growth of the money supply and money spending over time that will yield a stable price level. The answer to the question is that in a currency board system, money supply growth comes to depend heavily on the monetary policy pursued by the country whose currency is used as a reserve. As long as inflation in the reserve country is stable, the currency board will automatically cause a similar (but not identical) inflation rate in the currency board country. Thus, if money supply growth in the currency board country is too rapid, so that inflation occurs, individuals would shift to buying goods in other countries and people in other countries would refrain from buying the now more expensive goods produced in the currency board country. This would produce a trade deficit (or smaller surplus), all else equal. This deficit would drain currency reserves from the currency board and bring about an automatic contraction of the money supply and, with it, a fall in the inflation rate.

Alternatively, should the money supply and money spending grow more slowly in the currency board country than in the reserve currency country, its lower rate of inflation would lead to increased exports to the reserve currency country. This would lead to a balance of payments surplus, an inflow of reserve currency, a deposit of some of this currency in banks (which would augment their reserves), and a multiple expansion of the money supply and a more rapid rate of growth of money spending.[7]

It is not an uncommon event for economies to experience sudden and dramatic changes in the public's willingness to hold bank deposits. A monetary system should be able to accommodate shifts in the composition of money balances between currency and deposits in a way that does not alter the size of the money stock. A currency board regime may be ill-suited to deal with such changes. Should such a sudden desire for currency manifest itself in a currency board system, there is no mechanism by which currency can be supplied to accommodate the sudden surge in demand.[8] Instead, the money supply must shrink, causing price deflation. This phenomenon is what economists have in mind when they say that currency board countries do not have a lender of last resort. In this instance, it is the absence of a central authority for supplying the additional currency demanded by the public.

[7] There is a popular alternative theoretical explanation for the behavior of the balance of payments, the so-called Monetary Approach. It suggests a somewhat different chain of events if the currency board country's money supply growth is insufficient to accommodate the growth in money demand following a growth in real income. According to this approach, the growth in real output would increase the demand for money. If the domestic money supply did not expand to accommodate this demand, actual money holding would then be less than desired holdings. In order to build up money balances, individuals would be led to refrain from spending. Some of the decreased spending would fall on imported goods tending to produce a balance of payments surplus, an inflow of reservable currency and an expansion in the money supply (some of the reservable currency would become additional bank reserves on the basis of which additional deposit money could be created). This analysis would also be relevant to a situation in which a reservable asset such as gold is used in place of a reservable currency. If this theory is correct, it suggests that from time to time the economy would be placed under deflationary pressure as individuals attempted to build up their money balances. Similarly, the economy would come under inflationary pressure if the domestic money supply grew too rapidly. For a discussion of this approach, see Mordechai E. Kreinin and Lawrence H. Officer, *The Monetary Approach to the Balance of Payments: A Survey*, Princeton Studies in International Finance. No. 43, (Princeton: 1978).

[8] The ratio of currency to deposits has undergone many and sometimes rapid changes in the United States. For an examination of the behavior of the currency ratios during the period 1920-1980, see Mark Ladenson and Gail Makinen, "The Currency Ratios 1920-1980: A Re-examination," *Atlantic Economic Journal*, Dec. 1992.

Similarities to Dollarization

A currency board is a monetary arrangement that most closely resembles the unilateral adoption by a country of a foreign currency, popularly known as "dollarization." Some countries do not issue their own local currency, but instead use foreign currencies for their domestic transactions. For example, Ecuador and Panama use the U.S. dollar. In these countries, the money supply grows when citizens receive more dollars through international trade and investment and unilateral transfers then they send abroad for these purposes. These same factors cause the money supply to increase under a currency board. In a dollarized country, local credit conditions are altered anytime the Federal Reserve alters monetary policy, just as in a country with a currency board tied to the dollar.

The only economic difference between the two is that a currency board is a way for a country to both have the benefits that come from a link to a large stable valued currency and, at the same time, earn the income called *seigniorage* that comes from issuing its own money. By contrast, the seigniorage of dollarized countries is collected by the U.S. government. This profit can be viewed in two ways. First, each dollar the U.S. government issues enables it to buy a dollar's worth of goods and services. Since it uses up some resources to print and maintain the dollar in circulation, the net amount of goods and services it can buy is somewhat less than a dollar. Second, issuing currency to buy goods and services can be thought of as an alternative to issuing interest-bearing debt for the same purposes. Hence, each dollar of currency issued means that the U.S. government saves the interest it would have to pay if it had instead issued interest-bearing debt. The amount of interest saved is not a one-time event. It is saved year after year. The *present discounted value* of those interest payments is equal to the amount of currency issued (less the cost to maintain that currency in circulation). By using another country's currency, a government gives up *seigniorage*.

A currency board enables a government to capture seigniorage. This occurs because the reservable assets held by the currency board as backing for the notes and coins that it issues would not likely be held entirely in foreign currency or metals. Rather, some part, potentially a large part, would be held in highly liquid interest earning assets (denominated in the reserve currency). The income earned on these assets over and above that required to defray the costs of operating the system would be available to the government. Thus, a currency board regime can generate seigniorage, but perhaps somewhat less than would be available under a comparable central banking regime.

Historically, many countries chose currency boards because they were very small and found a central bank an expensive institution to operate. This helps explain why currency boards were used extensively by many British colonial dependencies, some of which were small island states or sparsely populated areas. These colonial dependencies chose to operate a currency board instead of simply adopting the British pound because of the desire for seigniorage earnings.

Comparison with a Central Bank

To further highlight the characteristics of a currency board regime, it is useful to compare it to a central bank regime. To make a valid comparison, it must be with a central bank operating in a system of fixed exchange rates.[9] Such a monetary regime is compatible with both the gold

[9] The power of a central bank and monetary policy is greatly enhanced in a world that uses flexible exchange rates. However, since a currency board system is one of fixed exchange rates, it would be misleading to compare it to a central bank operating in a flexible exchange rate world.

standard and the so-called Bretton Woods system that evolved after World War II and remained a fixture of the world economy until the early 1970s.[10] Since the collapse of the Bretton Woods system, many developing countries have operated fixed exchange rate systems and some European countries participated in a fixed exchange rate system called the European Monetary System before the creation of the euro.

A fixed exchange rate regime imposes substantial limitations on the conduct of monetary policy by a central bank. Essentially, monetary policy is constrained by the necessity to maintain the fixed exchange rate. It would be difficult, for example, in such a regime to focus monetary policy on a goal designed to maintain high employment. To the extent that this requires interest rates below comparable rates elsewhere, it encourages the outflow of capital, a balance of payments deficit, and the loss of international reserves (either of gold or foreign exchange) as the central bank seeks to prevent the exchange rate from depreciating. The end result of policies that conflict with the need to maintain the exchange rate is a change in the balance sheet of the central bank: reserves of gold and foreign exchange are lost and replaced by government bonds or other domestic assets that are eligible for open market operations. Moreover, the pursuit of goals that conflict with the need to maintain the exchange rate are viable only in the very short run since, ultimately, the central bank would run out of reserves needed to support the exchange rate.

In a fixed exchange rate system, a central bank intent on maintaining the exchange rate is little different in its behavior from a currency board: It must stand ready to convert its money into gold or other foreign currencies on demand at the fixed rate of exchange. Moreover, as in a currency board regime, the monetary system in a central bank regime is unlikely to have its outstanding money supply backed 100% by gold and foreign exchange. But unlike a currency board, a substantial portion of the money stock would be "backed" by central bank and commercial bank holdings of assets denominated in domestic money. This allows the central bank to alter the money supply in the pursuit of domestic goals such as full employment, as long as this goal does not contradict the maintenance of the fixed exchange rate to the extent that it triggers large capital outflows.

The proponents of currency boards stress a crucial difference between the two systems: central banks maintain *pegged, not* fixed exchange rates whereas currency boards maintain fixed exchange rates. This means that the exchange rates in a so-called fixed-rate central banking system are often subject to unexpected changes. History demonstrates that when fixed exchange rate regimes prevailed, there were frequent changes in the exchange rates, often because the central banks were used to promote goals such as high employment that were incompatible with the exchange rate. When the rates were changed, it was often in response to massive speculative attacks on the currency in question. The attacks on the British pound and Italian lira that occurred in September 1992 and the East Asian currencies (Phillippines, Indonesia, Thailand, and Hong Kong) in 1997 are typical of the circumstances under which pegged exchange rates are changed.

Currency boards, on the other hand, automatically defend the exchange rate because they cannot pursue any other economic goal than currency convertibility and cannot hold reserves denominated in local currency. However, opponents of currency boards would argue that the viability of maintaining them when the exchange rate has become unsustainable ultimately comes down to the willingness of the government to accept deflation and recession, regardless of the fact

[10] The U.S. occupied a special place in the Bretton Woods system in that it supplied the reserve currency. Thus, the U.S. central bank did not face many of the constraints faced by other central banks. The comparison in this section is a comparison with a non-reserve currency central bank.

that combating these phenomena are not stated goals of monetary policy.[11] When the exchange rate becomes misaligned, the currency board must be abandoned unless the government is willing to accept the deflation and accompanying recession necessary for the exchange rate to become competitive again – just as is true in a fixed exchange rate regime. Speculators moved against both the Argentine and Hong Kong currency board in recent years because they doubted that the government would accept deflation. In the case of Argentina they were right; not so with Hong Kong.

The Advantages and Disadvantages of Currency Boards

Advantages

There are both political and economic reasons why countries find currency boards an attractive alternative to central banks.

Currency Boards Eliminates High Inflation

Politically, while it is common to think of a currency board as constraining a nation's monetary policy, it also exercises a considerable restraint on the fiscal activities of a government. Since local currency can be issued only in exchange for the reserve asset or currency, it cannot be issued to purchase government debt and, hence, a government could no longer finance budget deficits by recourse to the printing press as it could under some central bank arrangements.[12] Thus, countries that have a long history of inflation linked to the financing of fiscal deficits by resort to the printing press or who place a large premium on relatively stable prices are likely to find a currency board regime an attractive alternative to a central bank. Argentina adopted a currency board after a very troubled history of high and unstable inflation rates. The adoption of currency boards by Estonia, Lithuania, and Bulgaria was motivated by a belief that this action would ensure a stable valued currency and would facilitate their transition to market economies and serve to entice foreign investment.

When monetary systems function smoothly, the important role that stable money plays in market economies is frequently overlooked or neglected. Money performs three important functions. First, it facilitates exchanges and reduces the time and trouble inherent in barter. As a result it enables economies to produce and exchange more goods and services than would be possible in a system that relied on barter. Second, money as a common denominator in terms of which all goods and services can be expressed makes possible modern accounting systems and the entire system of contracts that are a cornerstone of business. Third, money is said to be a "store of value," which means that generalized purchasing power or wealth, either in the form of money

[11] The currency board country would also have to be willing to accept inflation when the money supply grew too rapidly, but the inflation rate would be far lower than what most countries have historically experienced prior to the adoption of their currency boards.

[12] The ability of a central bank to print money to finance a budget deficit depends on the type of international monetary regime to which it is committed. A gold standard, for example, requires that central bank monetary policy be geared to maintaining a given price for gold. Similarly, a non-gold standard fixed exchange rate regime requires that the monetary policy of a central bank must be governed by a commitment to maintain the exchange rate within prescribed limits. Both types of regimes substantially limit the ability of a central bank to provide financial support to the government. Any support that it gives must be compatible with the objective to either keep the price of gold constant or the exchange rate within prescribed limits. In a flexible exchange rate regime, these constraints are removed (as they are in a fixed exchange rate regime if the government is not really committed to maintaining the exchange rate).

itself or financial instruments denominated in the unit of account, are made possible in societies which have money. And these financial instruments play a major role in the functioning of market economies.

When monetary systems do not function well, meaning those that experience episodes of high inflation, the established money loses these qualities. With this development, exchange is likely to revert to barter or involve the use foreign currency, prices are quoted in a variety of different foreign monies, individuals are no longer content to hold financial assets denominated in local currency, resources are wasted avoiding inflation and repricing goods, and contracts disappear or become very short term. Furthermore, production is hampered by low levels of foreign investment and a lack of credit, as financial institutions tend to suspend operation or fail to lend except for very short periods of time, and unemployment rises. In general, a poorly functioning monetary system can be a severe handicap to an economy. Because of this, some countries have opted for a currency board in the belief that it will produce for them a stable currency and a stable monetary system.

Table 1. Inflation Rate Before and After the Adoption of A Currency Board in the 1990s

	Three Years Before			Three Years After		
Argentina	3086.9%	2313.7%	110.0%	6.2%	1.8%	0.4%
	(1989)	(1990)	(1991)	(1992)	(1993)	(1994)
Bulgaria	62.1%	123.0%	1053.9%	18.8%	2.6%	10.4%
	(1995)	(1996)	(1997)	(1998)	(1999)	(2000)
Estonia	17.2%	210.6%	1069.0%	89.8%	47.7%	29.0%
	(1990)	(1991)	(1992)	(1993)	(1994)	(1995)
Lithuania	1021.0%	410.4%	72.1%	39.5%	24.7%	8.8%
	(1992)	(1993)	(1994)	(1995)	(1996)	(1997)

Source: International Monetary Fund

Notes: The third year represents the year of currency board adoption.

Currency Boards Prevent "Time-Inconsistency"

A second political advantage to currency boards is that they are likely to be a good way to deal with what economists call the "time inconsistency" problem. The ultimate purpose of economic activity in market economies is the well-being of the consumer. That well-being consists of being able to consume goods and services that come closest to satisfying wants, to arrange work and leisure that conforms to individual preferences, to enable consumers to divide their income between consumption and saving in such a way that it maximizes their preferences between immediate and future gratification. Economic activity also requires judicious decisions about choices for investing saving among alternative investment possibilities, and so on. All of this activity requires information. An important part of this information concerns the likely policies of the government, especially the monetary policy of the central bank. On the basis of expectations about these policies, individuals make choices and conclude agreements or make contracts.

A "time consistent" policy regime is one in which the government carries out the polices that it announces. In this case, individual expectations are fulfilled and the choices they have made lead to an optimum outcome for them and for the economy. However, there is an incentive for the government to "cheat," or to carry out policies that are different from those expected to prevail by economic agents. Suppose, for example, that a central bank had as its announced goal a stable

price level and that economic agents believed that it would carry out policies to achieve this end. These agents would then make contracts, for example, to fix money wages based on the expectation that prices would be stable. If a central bank should suddenly depart from this policy and, instead, engineer inflation, this would reduce the real wage of labor and encourage businesses to hire more workers or work the existing employees extra hours. This policy might generate a more rapid rate of GDP growth and a lower unemployment rate, at least temporarily until it came time to renegotiate various contacts. This change in central bank behavior would not, however, be optimum from the perspective of economic agents. It is *inconsistent* with the optimizing behavior of economic agents and from that perspective it is sub-optimal. Had these agents known what was going to happen, they would have built this into their expectations and their behavior. The central bank would have "fooled" people once, but it is unlikely they would be able to fool them again. By losing credibility, the central bank's future policy would then be less effective. Perhaps it is not surprising that countries who have adopted currency boards are often those in which monetary policy has lost its credibility.[13]

A currency board is less likely to engage in time-inconsistent behavior because it cannot engage in discretionary changes in the money supply and, thus, cannot engineer monetary surprises because it is bound by a rule to increase currency only to the extent that it acquires reservable assets. It has no discretion in altering the amount of currency in circulation. This is not the case with a central bank, especially one that operates in a country linked to other countries by flexible exchange rates. Thus, it can be argued that a currency board regime is more likely to ensure *time consistent* policies than would a central bank regime.

Currency Boards Encourage Trade and Investment

The major economic advantage that a currency board has over floating exchange rates is that exchange rate stability encourages international trade and investment. It does so by eliminating the exchange rate risk involved in these transactions under floating exchange rates. Since many economists believe that international trade and investment are an important source of growth for developing countries, it is argued that a currency board could have a significant effect on the sustainable rate of economic growth. Traditional fixed exchange rate regimes also eliminate exchange rate risk, but to the extent that currency boards are viewed as more durable than fixed exchange rate regimes, currency boards do more to encourage international trade and investment. Currency board proponents tend to argue that the extensive list of fixed exchange rate failures in the 1990s have led investors to believe that currency boards are the only fixed exchange rate regime that can be trusted. Hence, they claim, only currency boards significantly increase international trade and investment.

Disadvantages

Currency boards also have their critics. The critics tend to concentrate their attack along several lines.

Central Banks Can Act Responsibly

First, they point out that there is a long history of responsible behavior by central banks. The central banks in many countries have had great success in producing long periods of price

[13] See Finn Kydland and Edward Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy,* v. 85, 1977, p. 473; and Robert Barro and David Gordon, "Rules, Discretion, and Reputation in a Model of Monetary Policy," *Journal of Monetary Economics,* vol. 12, 1983, p. 101.

stability and high employment. The degree to which they are able to achieve this goal depends on several factors. Important among them are an absence of negative supply side shocks, such as those that arise from disruption in the world's output of oil, and a responsible fiscal policy on the part of government. Recent studies suggest that the ability of central banks to pursue a goal of price stability depends critically on government fiscal policy. Where fiscal deficits are large, even in the best of times, where domestic capital markets are poorly developed, and where access to international credit is limited, central banks are often forced to print money to cover fiscal shortfalls. Countries in these circumstances are prone to a poor inflation performance. This is not the fault of central bank regimes per se. Rather, the fault lies in a political process.[14] Basically, critics of currency boards argue that floating exchange rates offer valuable benefits and policymakers should focus on ways to convince governments to act responsibly enough to enjoy them.[15]

The critics also question whether currency boards really solve the "time inconsistency" problem. While it is true that a currency board itself cannot bring about discretionary changes in the supply of currency (and money), they are exposed to the "time inconsistency" tendencies of the reservable asset countries. Thus, for example, if the U.S. Federal Reserve were to engage in "time inconsistent" behavior, it would be communicated to a country such as Argentina regardless of the fact that Argentina has a currency board.

Currency Boards Make a Country Vulnerable to Economic Shocks

Another and more forceful line of criticism is that countries are often faced by a variety of shocks that are most appropriately dealt with by adjusting exchange rates. Since this is virtually impossible in a currency board regime, these shocks must be dealt with either by deflation or inflation. Most worrisome are the deflationary adjustments. The economic travails of Argentina, which abandoned its currency board, have been used by critics to demonstrate problems posed by deflation in such a monetary regime.[16]

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[14] It is useful to note that economists have devised a wide range of monetary rules compatible with floating exchange rates that "tie the hands" of irresponsible policymakers. For examples, see U.S. Library of Congress, Congressional Research Service, *Formulation of Monetary Policy by the Federal Reserve: Rules vs. Discretion,* by Marc Labonte, CRS Report RL31056 and *The Federal Reserve: Should Its Sole Mandated Goal Be Price Stability?* by Marc Labonte and Gail Makinen, CRS Report 98-16E.

[15] By contrast, proponents argue governments will never act responsibly enough to enjoy the benefits, making currency boards a "second best" solution.

[16] This critique draws heavily from a small but important literature in monetary economics known as the theory of "optimum currency areas." When a currency board is created, it automatically ties a local economy to the economy of the reserve currency country through a fixed exchange rate between the two currencies. A question arises whether the new larger currency area is an "optimum" arrangement. If the two regions' business cycles are well harmonized, then the arrangement is optimum. Business cycles tend not to be well optimized if an economic shock does not affect the two regions' economies equally. Even if the two regions do not have well harmonized business cycles, a joint currency may still succeed. The attributes of an optimum area depend on the degree to which wage and price flexibility characterize the new region. If wages and prices are quite flexible in both the currency board and reserve currency countries, then a case can be made that they should be linked together with a fixed exchange rate (or, for that matter, with a common currency) because both will respond in the same way to demand and supply shocks. It is often said that wage and price flexibility is a key to the success of Hong Kong's currency board. If the degree of price and wage flexibility is quite different in the two countries, then the case for a fixed exchange rate between them is weaker. However, there are a number of factors that can substitute for price flexibility and, thus, warrant the establishment of a common currency area. There are four major substitutes. First, how integrated are the two nation's financial systems? In other words, are interest rate changes highly correlated between the two nations? The more complete the integration, the better. Second, what is the degree of freedom with which labor and capital can move within the larger currency region? The higher the degree of factor mobility, the stronger the case for a fixed exchange rate. Third, what is the

The Argentine peso was linked on a one-to-one basis to the U.S. dollar by a currency board.[17] Between mid-1995 and mid-2001, the U.S. dollar appreciated, in real or inflation-adjusted terms against a market basket of 26 currencies, by about 33%. The increase raised the price of Argentine exports in foreign countries and reduced the price of foreign goods in Argentina by roughly a comparable amount. As a result, markets for Argentine exports withered and the people of Argentina substituted cheaper foreign goods and services for comparable goods produced domestically. The result was a trade deficit, an outflow of money to cover the deficit, and constant deflationary pressure in Argentina. Because of the currency board, Argentina could not alter the peso/dollar exchange rate. Rather, to restore equilibrium with balanced international trade, Argentina had to rely on an increase in unemployment to cause wages and prices to fall (with wages having to fall more than prices). When the unemployment rate rose above 15% and the country was threatened by extreme political instability, policymakers decided they could no longer tolerate the consequences of continued deflation. They decided to abandon the currency board and revert back to a central bank regime.

Typically, when the exchange rate is out of equilibrium, devaluation can help an economy recover by making exports an import-competing goods more competitive. What made Argentina's problems so difficult to solve is that although the overvalued exchange rate had become highly deflationary, the currency board had encouraged economic developments that made abandoning the currency board even more damaging. For example, the Argentine banking system became highly dollar-denominated. Following the devaluation, the entire banking system became insolvent because the banks now needed more pesos to pay off their dollar-denominated liabilities.

The Argentine example, the critics claim, contradicts the claim of currency board proponents that currency boards eliminate the economic risks that prevent developing countries from receiving foreign investment and enjoying the low interest rates that U.S. borrowers enjoy. Currency boards only eliminate exchange rate risk. In countries such as Argentina, they may in fact have increased economic risk, leading to higher interest rates. Economic risk can be increased, as in Argentina, by subjecting the country to exchange rate shocks that may have little to do with their own economic and financial conditions. Rather, the country is exposed to the international exchange rate behavior of the reserve country to which it has linked its currencies and this can have serious adverse economic consequences when the conditions for an optimum currency area do not prevail. Table 2 illustrates the severity of the economic crisis that Argentina underwent before and

degree of mutual trade between the two countries? The more integrated the goods and services markets and the larger the proportion of trade between the two countries, the stronger is the case for a fixed exchange rate. Fourth, some individuals have argued that the case for a fixed exchange rate embodied in a currency board regime is strengthened if the political process in both countries is supportive of the fixed exchange rate relationship. This requires a shared commitment to both fiscal and monetary stability, including fiscal transfers when one region's growth falls below the other's. One can see that the 50 U.S. states share all of these qualities, making the "shared" dollar a success. The literature on "optimum currency areas" suggests that a currency board arrangement, whose purpose as explained above is to achieve price stability would not be an optimum arrangement if both countries did not possess a high degree of wage and price flexibility and the factors that could substitute for or mitigate this difference are not present. Thus, one cannot make a general case for or against currency boards. They must be evaluated on a case-by-case basis depending on the degree to which they contribute to an optimum currency area. But it can be argued empirically that most currency board countries tie their currency to reserve countries that have economies with very little in common with their own. As a result, the currency board country is frequently stuck with a monetary stance inconsistent with the needs of its economy. For the seminal article in this literature, see Robert A. Mundell, "A Theory of Optimum Currency Areas," *American Economic Review*, vol. 51, September 1961, pp. 657-665.

[17] One of the foremost experts on currency boards, Dr. Kurt Schuler, maintains that Argentina did not operate an orthodox currency board. Rather, it is more appropriate to call it a "convertibility" system. See Schuler, Kurt. "Was Argentina's 'Convertibility' System a Currency Board?" Unpublished paper. November 14, 2003.

after the devaluation in 2001. In 2002, GDP shrank by nearly 11%, and output is still far below its pre-crisis level.

Table 2. Economic Indicators in Argentina

	2000	2001	2002	2003
Economic Growth	-0.8	-4.4	-10.9	5.5
Unemployment	14.7	18.1	17.5	17.3
Inflation	-0.9	-1.1	25.9	14.3
Exchange Rate (Peso/Dollar)	1.0	1.0	3.3	2.9

Source: International Monetary Fund, Economist Intelligence Unit

Events in August 1998, the critics claim, also expose another weakness of a currency board. The Hong Kong Monetary Authority, the official body responsible for administering the Hong Kong currency board, alleged that hedge funds and other large investors were participating in what they called a "double play" on Hong Kong financial markets. It was alleged that these hedge funds were simultaneously short selling securities on the Hong Kong stock market and selling Hong Kong dollars back to the currency board. A short sale of an equity is a financial derivative contract whereby the buyer profits if the equity price falls. As a result of the alleged double play, the money supply shrank, the stock market fell 45% below its previous year peak, and unemployment reached its highest level in 15 years. These activities continued until the government interceded, purchasing 7.3% of the stock market's value at a cost of $15.2 billion with funds from previously accumulated budget surpluses.[18]

Currency Boards Cannot Act as a Lender of Last Resort

Another criticism made of currency boards is that they cannot fill a potentially vital role played by central banks, that of a lender-of-last-resort to the nation's financial system. History is full of examples of bank panics. Some event causes individuals to fear that banks will not be able to redeem their deposits in currency on demand. When a large number of depositors suddenly demand conversion, most banks are not in a position to honor their requests because banks do not hold large sums of currency. However, banks usually make a good faith effort to do so and this means trying to raise cash by selling assets or calling in loans. This has often involved dealing in markets that are financially distressed with falling prices that do not reflect the underlying value of the assets. One way to forestall a panic or prevent it from reaching a panic state is for the monetary authority to buy these assets from banks or make loans to them and, in the process, supply them with currency. When the public becomes satisfied that it can get currency for its deposits, the panic will subside and the destruction brought about by panic will be minimized.

[18] Skeptics of the government claim that no "conspiracy" took place – hedge funds simply sold the stock market short because of rational fears of the "Asian crisis" spreading to Hong Kong. For a more detailed description of this event, see Financial Stability Forum, "Report of the Working Group on Highly Leveraged Institutions," March 2000, p. 130-132; "Fair Shares," *The Economist*, Oct. 29, 1998.

All currency issued by a currency board is backed by foreign assets. But currency boards do not back all bank deposits; only the fraction of bank deposits held as reserves are in effect backed by foreign assets. Thus, all deposits could not be honored by the currency board in the event of a bank run. Currency boards cannot provide currency to banking institutions in such situations since increased issues of currency depend on the acquisition of the reserve asset or currency which banks are unlikely to possess. Thus, countries with currency boards must have other financial arrangements for dealing with panics. Sometimes these are performed by the national treasury departments. But only a central bank can expand overall liquidity through its control of the money supply. A treasury can only shift purchasing power from taxpayers or bondholders to the banking system, greatly weakening the lender-of-last-resort function. However, some argue that the lender-of-last-resort function has been largely abused in developing countries, creating moral hazard through the bailout of well-connected financial actors. If that should be the case, the loss of the lender-of-last-resort function may do more good than harm.[19]

Setting up a Currency Board

To establish a currency board, a government must obtain assets on the basis of which currency can be issued. The government (including any existing central bank) may itself have a gold stock or be in possession of substantial foreign exchange reserves. If not, the necessary foreign reserve currency would have to be acquired as a gift or grant from the country whose currency is to serve as a reserve or obtained from an international agency such as the IMF. Relevant to the IMF, on October 6, 1992, President George H.W. Bush signed the Foreign Operations Act (P.L. 102-391) which allows the $12 billion U.S. quota increase to be used to "...support monetary stability in member countries through the instrumentality of currency boards."[20]

Once the board is established and the assets acquired, two basic options are available. In the first, a new currency could be introduced and given (as a gift) to the existing population according to a prearranged formula. At the same time, an exchange rate would be established for the reserve currency or reserve asset. Once the new money were introduced, it would become the functioning money of the country. It would be used in transactions, held as a part of liquid wealth, and become the unit in terms of which contracts are written and prices quoted. Should an existing currency be in circulation at the time a new currency board money is introduced, it could continue to circulate and exchange for the new currency at whatever rate was dictated by the market. If the existing currency has legal tender status, it is important that similar status be accorded the notes of the currency board. Presumably, as the new currency took hold, it would drive the existing currency out of circulation.

As an alternative, an existing currency could be used which would now become the liability of the currency board. All foreign exchange or precious metals held by the government and central

[19] Proponents of currency boards have argued that foreign banks would probably come into the market to spur competition and aid in development. The incentive to do so would be especially strong for banks from the country whose currency is used as a reserve since there would be no exchange rate risk between the local money and the reserve currency. They argue that the presence of foreign banks which are branches of banks in the reserve currency country would obviate the need for a lender of last resort. Thus, a desire to swap local deposits for local currency is met by foreign banks borrowing reserve currency from their head offices and using it to obtain local currency from the currency board. In effect, the currency board country has had a sudden loan from the reserve currency country which enables it to meet a sudden demand for currency. There is no guarantee that this loan would occur, however. The foreign bank may prefer to curtail its lending instead. It is also uncertain how a demand could be met in the absence of foreign branch banks.

[20] Another possibility is for the currency board to pay a slight premium for foreign currency in order to build up its assets. The subsequent profit from its portfolio could be used to pay off the cost of the premium.

bank would simultaneously be transferred to the currency board and become its assets and would then be valued in terms of the reserve currency. Under this option, as in the other, an exchange rate would have to be fixed relative to the reserve currency or asset such that the reserves of the currency board backed 100% of the existing currency. In addition, since the exchange rate would be the rate at which local prices are converted into world prices and vice versa, it should not be too high so that exports are discouraged and imports encouraged nor too low so that exports are in effect subsidized and imports taxed. Thus, the exchange rate should be one that reflects, to the extent possible, market conditions.

To maintain the independence of any currency board and to safeguard the assets held by the board from government confiscation, proponents have argued for two legal safeguards. First, a majority of board members appointed would be foreign nationals. Second, the assets of the board would be deposited in a foreign country such as Switzerland or Sweden with the proviso that the governments of the new currency board states would be denied access to the funds.

Concluding Comments

While the introductory discussion of a currency board suggested that it would be a radical departure from the way that monetary policy is presently conducted in the United States, it may not be such a radical alternative for countries that are just acquiring control over their own monetary arrangements, have experienced a currency crisis, or who have had a history of chronic inflation. This may account for its adoption by Argentina, Bulgaria, Lithuania, Estonia, and explain why Indonesia briefly considered adopting it during the Asian crisis.

Currency board proponents base their case on an argument that is essentially political – countries with profligate pasts need to have their "hands tied" by a currency board to prevent bad policymaking in the future. In evaluating the relevance of currency boards for various countries, it is useful to avoid comparing them to some ideal monetary system. Rather, proponents argue, currency boards should be compared to central banking regimes now in operation in these countries, whose performance may in some instances serve as an impediment to the development of a market economy, at that stage of the country's economic development.

The case for currency boards is based on their ability to supply a currency that is both internally and externally convertible, and is backed 100% by reserves of either precious metal or foreign currencies. The case is strengthened when it is pointed out that they cannot alter the domestic money supply through transactions in assets denominated in local currency.

As such, proponents argue that currency boards are an attractive alternative to central banks for introducing a stable valued money that could fulfill the role of unit of account, medium of exchange, and store of value. Success in these roles could shore up the development of market economies, encourage the development of financial institutions, and encourage financial integration with the reserve currency country.

In addition, currency boards would have a restraining influence on fiscal policy in these countries. Essentially, they would make it impossible to finance budget deficits through a central banking printing press. This accomplishment alone would contribute markedly to price level stability, which could speed up the process of international investment needed for modernizing and unleashing the productive potential of many nations.

Potential shortcomings of this regime, however, are several. Currency boards cannot serve as lenders-of-last-resort and the economies of currency board countries are exposed to all the shocks that affect the external value of the currency which serves as the basis of their reserves. In the face of these shocks, the entire adjustment in currency board countries is placed on real wages

and real interest rates if excessive unemployment and slower than normal GDP growth is be avoided. In typical monetary arrangements, economic adjustment could come about through exchange rate adjustment. But with a currency board, exchange rate adjustment could only come about by abandoning the currency board, which, experience shows, would likely trigger a financial crisis.

For a currency board to deliver stable economic growth, the country must tie its currency to a country that experiences similar economic shocks and conditions in order to enjoy a monetary policy appropriate for its economy. Otherwise, as the Argentine case illustrates, a currency board country is likely to experience periods of recession brought on by an incompatible exchange rate. The problem here is that most countries currently considering currency boards are developing countries or those emerging from decades of central planning with a poor or incomplete fiscal and monetary policy track record. Since they hope to restore or gain confidence through the adoption of a currency board, they are seeking a reserve country with a high degree of monetary credibility, most likely one of the world's major currencies – the dollar, the euro, the Swiss franc, the British pound, or the yen. But in most cases, the shocks affecting the economies of developing countries would have very little in common with the shocks affecting the economies of the five major currencies. For that reason, developing countries that adopt a currency board risk experiencing the same problems that plagued Argentina and, ultimately, caused it to abandon its currency board for a central bank regime, triggering economic and financial collapse in the process.

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